

# SINGAPORE NATIONAL AVIATION SAFETY PLAN 2022-2024

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## CONTENTS

<b>FOREWORD</b>	<b>5</b>
<b>INTRODUCTION</b>	<b>6</b>
PURPOSE	7
DEVELOPMENT AND REVIEW OF THE NASP	7
<b>SAFETY OBJECTIVES</b>	<b>8</b>
<b>SAFETY CHALLENGES</b>	<b>9</b>
OPERATIONAL SAFETY RISKS	9
RISKS ASSOCIATED WITH COVID-19 DISRUPTION	9
CHANGES TO THE OPERATING ENVIRONMENT	10
TECHNOLOGIES	10
<b>STRATEGIC PRIORITIES</b>	<b>11</b>
MITIGATE OPERATIONAL SAFETY RISKS	11
ENHANCE REGULATORY REGIME	11
ENABLE ENTERPRISE AND INNOVATION	11
CONTRIBUTE TO AVIATION SAFETY GLOBALLY AND REGIONALLY	12
<b>ACTIONS</b>	<b>13</b>
OPERATIONAL SAFETY	13
POLICIES AND RULES	18
SAFETY MANAGEMENT	20
DATA AND DIGITALISATION	22
REGIONAL AND GLOBAL AVIATION SAFETY	24
<b>APPENDIX A – ABBREVIATIONS AND ACRONYMS</b>	<b>27</b>

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## Foreword

Aviation is a key contributor to Singapore's economy. While the COVID-19 pandemic has decimated international air travel and severely impacted the Singapore aviation industry, we are optimistic that brighter skies are on the horizon as Singapore ramps up its connections to the world.

Aviation has become safer over the years, brought about by innovations in technology, improvements to safety processes and focus on compliance and safety management. While there have been no fatal accidents in past two decades, we must continue to upkeep safety and not take safety for granted.

As we emerge from the COVID-19 pandemic and ramp up operations, aviation safety must remain non-negotiable and the top priority for the Singapore aviation sector. The COVID-19 pandemic has introduced unprecedented challenges, but we have built good foundations over the years – a strong safety regime, strong safety culture, and strong safety leadership. These foundations are critical not only in addressing COVID-related safety risks, but also other existing and emerging aviation safety risks. The strong foundations reflect the collective effort and unwavering commitment of our aviation industry towards safety.

Building on these foundations, the National Aviation Safety Plan (NASP) 2022-2024 sets out Singapore's priorities and actions to keep aviation safe. The Civil Aviation Authority of Singapore (CAAS) and the Transport Safety Investigation Bureau (TSIB) will work closely with the aviation industry to implement the NASP. Through the NASP, Singapore will also contribute to advancing aviation safety globally in collaboration with international and regional partners.

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## **Introduction**

### Purpose

The NASP sets out the objectives, challenges, strategic priorities, and the safety actions to be taken by, or driven by CAAS and TSIB, in collaboration with the aviation industry. The NASP is an action plan for the aviation industry to address key risks and safety challenges and complements the State Safety Programme (SSP) Document, which articulates Singapore's regulatory philosophy, values, and commitments to achieve our safety objectives.

Singapore has deep interests to contribute to safe and efficient international air travel. The International Civil Aviation Organization (ICAO), through the Global Aviation Safety Plan (GASP) and other initiatives, is advocating a proactive approach to manage safety and has identified global safety objectives, risk categories and desired outcomes. In this regard, the NASP supports the implementation of the ICAO GASP and its associated Asia-Pacific Regional Aviation Safety Plan (AP-RASP).

### Development and Review of the NASP

CAAS leads the development and review of the NASP in consultation with TSIB. The NASP is approved by the National Aviation Safety Committee (NASC) which is chaired by the Director-General of Civil Aviation and comprises representatives from the Ministry of Transport (MOT), TSIB and relevant Groups/Divisions within CAAS involved in safety regulation.

CAAS initiates and manages the review of the NASP every three years, or more frequently as required, to ensure the continued relevance of the NASP. In collaboration with the Singapore aviation industry, CAAS leads the identification and assessment of new or emerging risks as well as the review of existing risks.

CAAS monitors the implementation of the action items in the NASP and shares them with the members of the NASC and at industry engagement sessions. This process provides assurance that safety improvements are continuously made to achieve our safety objectives under the SSP. This process also provides the basis for initiating further safety actions as necessary.

## Safety Objectives

Singapore strives for high standards in aviation safety, underpinned by a strong safety regime, strong and positive safety culture and strong safety leadership. In this regard, Singapore has identified five safety objectives under its SSP. The safety objectives are as follows:

- a) Enhance the level of safety of Singapore's aviation operations, and in particular, to maintain zero fatal accidents involving entities under its safety oversight;
- b) Ensure that Singapore's aviation safety oversight and investigative regimes are effective, robust, aligned with ICAO Standards and Recommended Practices and keep pace with industry developments;
- c) Ensure that hazards in Singapore's aviation operating environment are proactively identified, and related risks assessed and mitigated to as low as reasonably practicable;
- d) Foster a positive safety culture and strengthen cooperation among industry stakeholders; and
- e) Pursue and advocate for the enhancement of aviation safety regionally and globally.

## **Safety Challenges**

While Singapore has a strong aviation safety regime, there remains both existing and emerging challenges that we must pay attention to. These challenges include the safety risks inherent in aviation operations as well as the risks associated with the disruption caused by the COVID-19 pandemic. Furthermore, changes to the operating environment and the increased adoption of technologies may pose risks to operations.

### Operational Safety Risks

Globally and regionally, there are five high risk categories that have been identified as key safety priorities. These are included in the NASP. They are:

- a) Runway incursion
- b) Runway excursion
- c) Mid-air collision
- d) Loss of control in-flight
- e) Controlled flight into terrain.

In addition, there are two safety risks of relevance to the Singapore aviation industry. These safety risks were identified based on data and information from the Singapore Safety Data Collection and Processing System (SDCPS), which include information from mandatory and voluntary reports, accident and investigation reports, safety oversight activities, Singapore's safety performances and trends, and industry engagements. These risks are:

- a) Systems component failure
- b) Ground occurrences resulting in damage.

Mitigating measures have been implemented over the years to directly address the abovementioned operational safety risks. While these measures remain in place, further actions are being developed to address these risks such as through strengthening of safety management capabilities and safety culture.

### Risks Associated with COVID-19 Disruption

The COVID-19 pandemic gave rise to unprecedented disruption to air operations and additional safety risks. Based on information from regional and global sources and the context of our operating environment, Singapore has identified the following COVID-19 related key safety risks:

- a) Decrease in competency of flight crew and air traffic controllers
- b) Malfunction of aircraft returned to service after prolonged inactivity
- c) Decrease in organisational focus on safety.

Other safety issues include the loss of familiarity with safety processes due to changes in the operating environment, weakening of safety culture and loss of safety expertise due to cost-cutting.

### Changes to the Operating Environment

Changes to the operating environment may pose safety implications to operations. For example, Changi Airport has been undergoing major infrastructural improvements and adopting changes to operations such as the re-building of Runway 2 and the construction of a new network of taxiways to accommodate aviation growth in the long term. With a significant change in operating environment, the downstream impacts on areas such as air operations and aerodrome safety must be addressed in a holistic manner. Another example is the safe integration of unmanned aircraft systems into the aviation system considering Singapore's busy airspace and urban environment.

### Technologies

The increasing use of technologies and automation can offer greater reliability and improve safety. Increasing automation of aircraft systems reduces the need for human intervention, thereby reducing human error, increasing efficiency, and achieving cost benefits. However, new technologies also introduce new risks to flight, air navigation services and aerodrome operations. We must address the potential impact of increasing reliance on automation systems. In cases of emergencies or system failures, the pilots' manual flying skills are crucial in ensuring safe outcomes. Existing regulatory frameworks and safety management systems (SMS) must adapt to build safeguards. Stronger competencies in assessing digital tools and systems and the related human factors must be developed.

## **Strategic Priorities**

Noting the safety challenges, the NASP outlines four strategic priorities, which anchor the development of safety actions for 2022-2024.

### Mitigate Operational Safety Risks

As air travel recovers, we must pre-emptively mitigate the COVID-19 pandemic related safety and operational safety risks that have been identified. These risks can manifest in our immediate operating environment and/or in the areas where Singapore air operators operate to. The measures include targeted interventions, as well as measures that may be taken by the industry under the SMS of individual service providers.

### Enhance Regulatory Regime

CAAS aims for robust regulations and effective processes that provide clear direction to the aviation industry and are in line with international best practices. We will also enhance safety management at the State and industry levels. CAAS and TSIB will continue to adopt an inclusive approach and engage the aviation industry in the development of policies and regulations.

Complementing efforts to strengthen the safety oversight and surveillance regime, CAAS and TSIB will also focus on strengthening the aviation safety culture in Singapore to enable individuals and organisations to internalise safety considerations and take initiative to proactively address safety risks.

### Enable Enterprise and Innovation

CAAS aims to enhance the aviation safety regulatory regime to support innovative and enterprise advancements while upholding safety and providing regulatory clarity.

CAAS will continue to collaborate with international partners to harmonise practices and, to the extent possible, reduce the regulatory compliance costs of the industry. In doing so, the aviation industry becomes more productive while reduced duplication of resources allows for regulatory resources to be prioritised for other safety enhancements. As of January 2022, CAAS has concluded 11 Technical Arrangements or Bilateral Agreements in areas including aircraft maintenance and certification with eight States / Regions.

## Contribute to Aviation Safety Globally and Regionally

CAAS and TSIB will continue to collaborate with ICAO and partners in the Asia-Pacific region to promote the harmonisation of best practices, provide technical and investigation assistance including through the Singapore Aviation Academy (SAA), and deepen regional data-sharing efforts to enhance regional aviation safety. We will also continue to contribute to international standards setting and international civil aviation development at ICAO.

## Actions

In line with the identified strategic priorities, the NASP establishes an action plan for 2022-2024 to guide the safety developments of the Singapore aviation sector. CAAS and TSIB have been working with the industry where appropriate to implement these actions, which cover five areas: operational safety, policies and rules, safety management, data and digitalisation, and regional and global aviation safety.

### (A) Operational Safety

Singapore is committed to reducing operational safety risks to as low as reasonably practicable. This section addresses operational safety risks identified earlier, through three areas – flight operations, provision of air navigation services, and aerodrome operations.

#### *Flight Operations*

Action	Lead	Completion
A.1 Focus safety oversight activities on Singapore air operators to ensure that operational and safety processes are robust, resources and crew manning are adequate, and crew proficiencies are monitored, as airline operations ramp up	CAAS	2022
A.2 Increase frequency of safety oversight activities on the airworthiness of aircraft that are returned to service following prolonged parking, through close monitoring of the aircraft reliability programme	CAAS	2022
A.3 Review and implement flight crew reactivation and induction training programmes to mitigate COVID-19 related risks, to enable safe ramp up of aviation activities	Singapore Air Operators	2022
A.4 Review the selection criteria, training requirements and oversight processes for Authorised Flight Examiners (AFE), to improve AFE capabilities and consistency of AFE assessments, ahead of the introduction of competency-based training	CAAS	2023

A.5	Review flight crew training regulations and collaborate with Singapore air operators to fully implement competency-based flight crew training to improve abilities to handle uncertain, unexpected and unprecedented in-flight situations	CAAS	2024
A.6	Review flight crew training requirements to reinforce key manual handling abilities and automation management competencies	CAAS	2024
A.7	Review regulations and guidance to provide clarity on the responsibilities of shippers and their agents in the declaration of dangerous goods, to reduce risk of carriage of undeclared dangerous goods	CAAS	2023
A.8	Launch communications and training campaign to increase awareness of undeclared dangerous goods and potential penalties, to address relevant risks including inadvertent carriage by unapproved entities	CAAS	2023
A.9	Expand the scope of the aircraft type acceptance evaluation to strengthen the airworthiness assessment of the type design of aircraft used by Singapore air operators	CAAS	2023
A.10	Develop regulatory framework and guidance for the operation of aircraft equipped with enhanced visual systems operating under performance-based aerodrome operating minima (PBAOM)	CAAS	2024
A.11	Develop a data analysis framework and programme with Singapore air operators to deepen analysis of flight operations safety data and occurrences and uncover safety vulnerabilities	CAAS, Singapore Air Operators	2024
<b>Related Safety Objective(s)</b>	<ul style="list-style-type: none"> <li>Enhance the level of safety of Singapore's aviation operations, and in particular, to maintain zero fatal accidents involving entities under its safety oversight</li> </ul>		

<b>Related Strategic Priorities</b>	<ul style="list-style-type: none"> <li>• Mitigate Operational Safety Risks</li> <li>• Enhance Regulatory Regime</li> </ul>
<b>Related GASP Goal(s)</b>	<ul style="list-style-type: none"> <li>• Goal 1: <i>Achieve a Continuous Reduction of Operational Safety Risks</i></li> </ul>
<b>Related AP-RASP Goal(s)</b>	<ul style="list-style-type: none"> <li>• Goal I: <i>Reduction in Operational Risks</i></li> </ul>

### *Provision of Air Navigation Services*

<b>Action</b>	<b>Lead</b>	<b>Completion</b>
A.12 Focus safety oversight activities on the air navigation services provider (ANSP) to ensure that operational and safety processes are robust, resources and air traffic control officer (ATCO) manning are adequate, and personnel proficiencies are monitored, as operations ramp up	CAAS (AAR)	2022
A.13 Enhance runway safety programmes at Changi and Seletar airports to further mitigate the risk of runway incidents	CAAS (AAR), ANSP, Aerodrome Operator	2022
A.14 Develop and implement an enhanced continuous training programme to prepare ATCOs for the resumption of high traffic volume at Changi and Seletar airports	ANSP	2022
A.15 Conduct review of air traffic control (ATC) coordination procedures with the Republic of Singapore Air Force to ensure smooth and safe civil-military coordination	CAAS (AAR), ANSP	2022
A.16 Review adequacy of ANSP's current agreements with private and public agencies to strengthen resources and capabilities to respond to Search and Rescue emergencies	CAAS (AAR), ANSP	2023
A.17 Pursue development of remaining regional Air Traffic Management (ATM) contingency plan with neighbouring area control centres	CAAS (AAR), ANSP	2025

A.18	Complete all Air Traffic Services Engineering Professionals (ATSEP) training so that the personnel who maintain Air Traffic Services (ATS) systems are equipped with the necessary skills and knowledge	ANSP	2023
A.19	Conduct assessment of air navigation systems to identify and mitigate potential vulnerabilities and single points of failure to enhance system robustness	ANSP	2023
A.20	Enable and ensure safe integration of unmanned aircraft into airspace through:	CAAS	
	(i) Implementation of Centralised Flight Management System (CFMS) as foundation to Unmanned Traffic Management (UTM) system		2022
	(ii) Development of 1 <sup>st</sup> spiral of UTM system		2023
	(iii) Development of 2 <sup>nd</sup> spiral of UTM system with info sharing with ATM system		2026

<b>Related Safety Objective(s)</b>	<ul style="list-style-type: none"> <li>Enhance the level of safety of Singapore’s aviation operations, and in particular, to maintain zero fatal accidents involving entities under its safety oversight</li> </ul>
<b>Related Strategic Priorities</b>	<ul style="list-style-type: none"> <li>Mitigate Operational Safety Risks</li> <li>Enhance Regulatory Regime</li> </ul>
<b>Related GASP Goal(s)</b>	<ul style="list-style-type: none"> <li>Goal 1: <i>Achieve a Continuous Reduction of Operational Safety Risks</i></li> </ul>
<b>Related AP-RASP Goal(s)</b>	<ul style="list-style-type: none"> <li>Goal I: <i>Reduction in Operational Risks</i></li> </ul>

## Aerodrome Operations

Action	Lead	Completion
A.21 Focus safety oversight activities on aerodrome operator to ensure that operational and safety processes are robust, resources and manning are adequate, and personnel proficiencies are monitored, as airport operations ramp up	CAAS	2022
A.22 Implement reactivation programme(s), including refresher training for standard operating procedures and aerodrome layout, for the re-deployment of ground personnel and equipment to enable safe ramping up of aviation activities	Aerodrome Operator	2022
A.23 Enhance airside works permit framework to improve the safety of activities in the vicinity of aircraft maneuvering areas	Aerodrome Operator	2024
A.24 Develop guidance for the safe conduct of trials and deployment of autonomous vehicles at the airside	CAAS	2022
A.25 Implement technology to enable direct communication between ATCO and ground handling personnel to mitigate risks of human errors during pushback and towing operations	Aerodrome Operator, ANSP, Ground Handling Service Providers	2024
<b>Related Safety Objective(s)</b>	<ul style="list-style-type: none"> <li>Enhance the level of safety of Singapore’s aviation operations, and, in particular, to maintain zero fatal accidents involving entities under its safety oversight</li> </ul>	
<b>Related Strategic Priorities</b>	<ul style="list-style-type: none"> <li>Mitigate Operational Safety Risks</li> <li>Enhance Regulatory Regime</li> </ul>	
<b>Related GASP Goal(s)</b>	<ul style="list-style-type: none"> <li>Goal 1: <i>Achieve a Continuous Reduction of Operational Safety Risks</i></li> </ul>	
<b>Related AP-RASP Goal(s)</b>	<ul style="list-style-type: none"> <li>Goal I: <i>Reduction in Operational Risks</i></li> </ul>	

(B) Policies and Rules

A robust and progressive aviation safety regulatory regime undergirds safe operations. This section highlights the key rule reviews and regulatory framework enhancements to strengthen the regulatory regime and enable or encourage enterprise and innovation.

<b>Action</b>	<b>Lead</b>	<b>Completion</b>
B.1 Modernise aviation safety regulatory framework through promulgation of new Air Navigation Regulations on: <ul style="list-style-type: none"><li>1) Dangerous Goods</li><li>2) Aerodrome (including Aviation Specifications for heliports)</li><li>3) Medical Standards</li><li>4) Aircraft Registration and Marking</li></ul>	CAAS	2022
B.2 Modernise aviation safety regulatory framework through promulgation of new Air Navigation Regulations on: <ul style="list-style-type: none"><li>1) Continuing Airworthiness Management</li><li>2) Airworthiness Directives</li><li>3) Certification of Aeronautical Products &amp; Approval of Design and Production Organisations</li><li>4) Aircraft Maintenance Organisations</li><li>5) Flight Crew Licensing</li><li>6) Authorised Flight Examiners</li><li>7) Aviation Training Organisations</li><li>8) Aircraft Maintenance Personnel Licensing</li><li>9) Maintenance Training Organisation</li><li>10) Flight Simulation Training Devices</li><li>11) Air Traffic Controller Licensing</li><li>12) Rules of the Air</li><li>13) Obstacle Height Control</li><li>14) Foreign Air Transport Operators</li><li>15) Aerodrome Rescue &amp; Fire Fighting Training</li></ul>	CAAS	2024
B.3 Develop a regulatory framework, including regulations and safety oversight processes for electric vertical take-off and landing (e-VTOL) aircraft operations and vertiport operations	CAAS	2023

B.4	Implement a State of Design for Modification (SoDM) regulatory framework to provide clarity on the roles and responsibilities of the stakeholders involved in maintaining the airworthiness of aircraft modification and repair designs	CAAS	2023
B.5	Promote the recognition and global adoption of Singapore’s industry standards for the incorporation of additive manufacturing into aircraft modification design or production processes	CAAS, Industry	2024
B.6	Study the implications of artificial intelligence and machine learning (AI/ML) on aviation operations, training activities and existing safeguards, and develop a policy on the use of AI/ML	CAAS, Industry	2024
B.7	Develop a regulatory framework for the oversight of continuous airworthiness management of general aviation aircraft	CAAS	2024
<b>Related Safety Objective(s)</b>	<ul style="list-style-type: none"> <li>Ensure that Singapore’s aviation safety oversight and investigative regimes are effective, robust, aligned with ICAO Standards and Recommended Practices and keep pace with industry developments</li> </ul>		
<b>Related Strategic Priorities</b>	<ul style="list-style-type: none"> <li>Enhance Regulatory Regime</li> <li>Enable Enterprise and Innovation</li> </ul>		
<b>Related GASP Goal(s)</b>	<ul style="list-style-type: none"> <li>Goal 2: <i>Strengthen States’ Safety Oversight Capabilities</i></li> </ul>		
<b>Related AP-RASP Goal(s)</b>	<ul style="list-style-type: none"> <li>Goal II: <i>Improvements in Safety Oversight and Compliance</i></li> </ul>		

## (C) Safety Management

Singapore's regulatory philosophy in aviation safety has evolved over the years to emphasise compliance and proactive risk identification and mitigation. This section highlights the key enhancements to safety management as well as to fostering a strong and positive safety culture and strong leadership, so as to strengthen the foundation for effective safety management.

<b>Action</b>	<b>Lead</b>	<b>Completion</b>
C.1 Develop and implement initiatives, in collaboration with the industry, to address potential areas for improvement that were identified in the 2021 safety culture survey	CAAS, Industry	2022
C.2 Develop a systemic approach to monitor the safety culture in Singapore and address areas for improvement, such as through biennial industry-wide safety culture surveys and subsequent industry engagements, to continuously strengthen safety culture	CAAS	2023
C.3 Increase participation in the Singapore Aviation Safety Charter through organisation outreach and engagements to broaden collective commitment to strengthen safety culture	CAAS	2024
C.4 Co-create a handbook with industry to share best practices for the fostering of a strong and positive safety culture	CAAS, Industry	2023
C.5 Strengthen the PSOe (present, suitable, operational and effective) SMS assessment tool through the identification and incorporation of SMS best practices, and develop outcome-based assessment criteria for the evaluation of SMS effectiveness	CAAS	2023
C.6 Enhance safety information exchange between CAAS and service providers to strengthen the continuous monitoring of safety performance of the industry	CAAS, Industry	2024

C.7	Revamp <i>The Leading Edge</i> publication for more frequent and compact content delivery and leverage social media, to better engage audience	CAAS	2022
<b>Related Safety Objective(s)</b>	<ul style="list-style-type: none"> <li>• Ensure that hazards in Singapore’s aviation operating environment are proactively identified, and related risks assessed and mitigated to as low as reasonably practicable</li> <li>• Foster a positive safety culture and strengthen cooperation among industry stakeholders</li> </ul>		
<b>Related Strategic Priorities</b>	<ul style="list-style-type: none"> <li>• Mitigate Operational Safety Risk</li> <li>• Enhance Regulatory Regime</li> </ul>		
<b>Related GASP Goal(s)</b>	<ul style="list-style-type: none"> <li>• Goal 1: <i>Achieve a Continuous Reduction of Operational Safety Risks</i></li> <li>• Goal 3: <i>Implement Effective State Safety Programmes</i></li> </ul>		
<b>Related AP-RASP Goal(s)</b>	<ul style="list-style-type: none"> <li>• Goal I: <i>Reduction in Operational Risks</i></li> <li>• Goal III: <i>Consistent and effective safety management system (SMS) and SSP</i></li> </ul>		

(D) Data and Digitalisation

Effective use of data analytics to enhance safety risk management has been encouraged over the years. The COVID-19 pandemic has accelerated digitalisation and the use of data to uncover safety risks and monitor safety capabilities. This section lays the foundation for more use of safety data analytics as well as digital adoption to improve service efficiency and cost-effectiveness.

<b>Action</b>	<b>Lead</b>	<b>Completion</b>
D.1 Develop requirements and guidance on data sharing and governance to facilitate the exchange of data and information (with relevant safeguards) between CAAS and industry	CAAS	2022
D.2 Expand sources of safety data and information in the SDCPS to support risk-based safety oversight	CAAS	2022
D.3 Identify and address operational risks through the implementation of the following data projects: <ul style="list-style-type: none"><li>- Go-around study at Changi Airport</li><li>- LOC-I events</li><li>- Development of flight data management dashboard</li></ul>	CAAS	2022
D.4 Improve the user experience of public-facing digital services to enhance delivery of regulatory services	CAAS	2023
D.5 Implement electronic licences for aircraft maintenance personnel and air traffic controllers to facilitate paperless end-state	CAAS	2024
D.6 Conduct a feasibility study on the use of electronic licences for Singapore flight crew, including cross-border interoperability and implementation issues	CAAS	2024

<b>Related Safety Objective(s)</b>	<ul style="list-style-type: none"> <li>• Enhance the level of safety of Singapore's aviation operations, and in particular, to maintain zero fatal accidents involving entities under its safety oversight</li> <li>• Ensure that hazards in Singapore's aviation operating environment are proactively identified, and related risks assessed and mitigated to as low as reasonably practicable</li> </ul>
<b>Related Strategic Priorities</b>	<ul style="list-style-type: none"> <li>• Mitigate Operational Safety Risks</li> <li>• Enhance Regulatory Regime</li> <li>• Enable Enterprise and Innovation</li> </ul>
<b>Related GASP Goal(s)</b>	<ul style="list-style-type: none"> <li>• Goal 1: <i>Achieve a Continuous Reduction of Operational Safety Risks</i></li> <li>• Goal 3: <i>Implement Effective State Safety Programmes</i></li> </ul>
<b>Related AP-RASP Goal(s)</b>	<ul style="list-style-type: none"> <li>• Goal I: <i>Reduction in Operational Risks</i></li> <li>• Goal IV: <i>Data-driven regulatory oversight</i></li> </ul>

(E) Regional and Global Aviation Safety

Singapore currently participates in various international and regional platforms, including in leadership positions, contributing to the development of aviation safety standards and capacity building efforts. This section highlights the key efforts that Singapore will undertake in collaboration with regional partners to support capability building and the achievement of the objectives and targets in the ICAO GASP, the Beijing Declaration (2018) and the AP-RASP. Within the Association of Southeast Asian Nations (ASEAN), we will also strive to advance existing aviation safety initiatives to fulfil the Kuala Lumpur Transport Strategic Plan (KLTSP) 2016-2025.

<b>Action</b>	<b>Lead</b>	<b>Completion</b>
E.1 Support ICAO initiatives and capacity building efforts in the Asia Pacific (APAC) region: <ul style="list-style-type: none"><li>- Develop guidance on governance framework for cross-border aviation safety data sharing projects</li><li>- Establish a mechanism for regional aviation safety data collection and sharing</li><li>- Support the development of the COVID-19 safety survey for APAC to gather data on key risks areas</li><li>- Support the development of the APAC annual safety report for 2021</li></ul>	CAAS	2022
E.2 Transition the AP-SHARE demonstration project on regional aviation safety data collection, analysis and sharing, in collaboration with partners, to a sustainable and inclusive operating model supporting regional safety capability building	CAAS	2022
E.3 Establish a Centre of Excellence for aviation safety to spur analysis and studies on key safety areas and emerging issues, to strengthen safety capabilities locally and regionally	CAAS	2022
E.4 Support the implementation of the ASEAN aviation safety related initiatives under the KLTSP 2016-2025	CAAS	2025

E.5	Build up Singapore's pool of subject matter experts to support technical assistance efforts	CAAS, TSIB	Ongoing
<b>Related Safety Objective(s)</b>	<ul style="list-style-type: none"> <li>Enhance the level of safety of Singapore's aviation operations, and in particular, to maintain zero fatal accidents involving entities under its safety oversight</li> <li>Pursue and advocate for the enhancement of aviation safety regionally and globally</li> </ul>		
<b>Related Strategic Priorities</b>	<ul style="list-style-type: none"> <li>Mitigate Operational Safety Risks</li> <li>Contribute to Aviation Safety Globally and Regionally</li> </ul>		
<b>Related GASP Goal(s)</b>	<ul style="list-style-type: none"> <li>Goal 1: <i>Achieve a Continuous Reduction of Operational Safety Risks</i></li> <li>Goal 4: <i>Increase Collaboration at the Regional Level</i></li> </ul>		
<b>Related AP-RASP Goal(s)</b>	<ul style="list-style-type: none"> <li>Goal I: <i>Reduction in Operational Risks</i></li> <li>Goal IV: <i>Data-driven regulatory oversight</i></li> </ul>		

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## Appendix A – Abbreviations and Acronyms

AAR	Aerodrome and Air Navigation Services Regulation Division, CAAS
AFE	Authorised Flight Examiners
AI/ML	Artificial Intelligence and Machine Learning
ANSP	Air Navigation Services Provider
APAC	Asia-Pacific
AP-RASP	Asia-Pacific Regional Aviation Safety Plan
AP-SHARE	Asia-Pacific Safety Data Sharing Programme
ASEAN	Association of Southeast Asian Nations
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
ATS	Air Traffic Services
ATSEP	Air Traffic Services Engineering Professionals
CAAS	Civil Aviation Authority of Singapore
CFIT	Controlled Flight Into Terrain
CFMS	Centralised Flight Management System
eVTOL	Electric Vertical Take-Off and Landing
GASP	Global Aviation Safety Plan
ICAO	International Civil Aviation Organization
KLTP	Kuala Lumpur Transport Strategic Plan
LOC-I	Loss of Control In-flight
MAC	Mid Air Collision
MOT	Ministry of Transport
NASC	National Aviation Safety Committee
NASP	National Aviation Safety Plan
PBAOM	Performance-Based Aerodrome Operating Minima
RE	Runway Excursion
RI	Runway Incursion
SAA	Singapore Aviation Academy
SDCPS	Safety Data Collection and Processing System
SMS	Safety Management Systems
SoDM	State of Design Modification
SSP	State Safety Programme
TSIB	Transport Safety Investigation Bureau
UTM	Unmanned Traffic Management